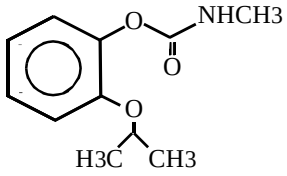
PROPOXUR

Propoxur is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 114-26-1

Molecular Formula: $C_{11}H_{15}NO_3$



Propoxur is a white to tan crystalline solid with a faint odor. It is soluble in methanol, acetone, and many organic solvents, and only slightly soluble in cold hydrocarbons (HSDB, 1991; Merck, 1989).

Physical Properties of Propoxur

Synonyms: 2-(1-methylethoxy)phenol methylcarbamate; aprocarb; BAY 39007; BAY 9010; o-isopropoxyphenyl n-methylcarbamate; Baygon; Bifex; Blattanex; Invisgard; Propyon; Suncide; Sendran; Unden

Molecular Weight:	209.24
Melting Point:	91.5 ^oC
Density/Specific Gravity:	(water = 1 at 4 ^oC)
Vapor Pressure:	3 x 10^{-6} mm Hg at 20 ^oC
Log Octanol/Water Partition Coefficient:	0.14
Water Solubility:	1,750 mg/l
Conversion Factor:	1 ppm = 8.56 mg/m^3

(Howard, 1990; HSDB, 1991; Merck, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

Propoxur is registered as an insecticide for the control of insects, spiders, ticks, and other miscellaneous arthropods. It is the active ingredient in a variety of products for use on a variety of sites. It is used for direct application to the pest organism, as in the case of wasp, bee, or hornet products. Propoxur is registered for use in and around farm animal areas, pet areas, eating establishments food marketing and food preparation/handling areas, and anywhere ants or roaches are a problem. It is also incorporated into flea collars (DPR, 1996).

The licensing and regulation of pesticides for sale and use in California are the responsibility of the Department of Pesticide Regulation (DPR). Information presented in this fact sheet regarding the permitted pesticidal uses of propoxur has been collected from pesticide labels registered for use in California and from DPR's pesticide databases. This information reflects pesticide use and permitted uses in California as of October 15, 1996. For further information regarding the pesticidal uses of this compound, please contact the Pesticide Registration Branch of DPR (DPR, 1996).

B. Emissions

No emissions of propoxur from stationary sources in California were reported, based on data obtained from the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of propoxur was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of propoxur. However, the United States Environmental Protection Agency (U.S. EPA) has compiled information on ambient concentrations of propoxur from several locations throughout the United States during 1987-88. The data from this information reported a mean concentration of 2.5 nanograms per cubic meter (ng/m^3) (U.S. EPA, 1993a).

INDOOR SOURCES AND CONCENTRATIONS

In the Nonoccupational Pesticide Exposure Study, levels of 32 pesticides were measured in 24-hour samples obtained inside and outside homes located in two cities. Approximately 70 homes in Jacksonville, Florida were monitored in each of three seasons, and approximately 50 homes in Springfield/Chicopee, Massachusetts were monitored in each of two seasons. Average indoor concentrations of propoxur ranged from 163 to 529 ng/m^3 in Jacksonville, and from 17.0 to 26.7 ng/m^3 in Springfield/Chicopee. For both cities, propoxur was more prevalent in indoor air than in outdoor air and average indoor propoxur concentrations were higher than corresponding outdoor concentrations (Immerman and Schaum, 1990).

ATMOSPHERIC PERSISTENCE

Based on the vapor pressure, propoxur will partition between the gas and particle phases in the atmosphere. Particle-associated propoxur will be subject to wet and dry deposition. The average half-life and lifetime to particles in the atmosphere is estimated to be about 3.5 to

10 days and 5 to 15 days, respectively (Atkinson, 1995; Balkanski et al., 1993). The dominant atmospheric loss process for gaseous propoxur will be by reaction with the hydroxyl radical. No information is, however, available concerning the rate constant for this reaction (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Propoxur emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to propoxur are inhalation, ingestion, and dermal contact.

Non-Cancer: Propoxur is a carbamate-type acetylcholinesterase inhibitor. Acute oral exposure of humans to propoxur depresses red blood cell cholinesterase levels. Cholinergic symptoms include blurred vision, nausea, vomiting, sweating, and tachycardia; however the effects are transient. Chronic inhalation exposure in humans has resulted in depressed cholinesterase levels, headaches, vomiting, and nausea (U.S. EPA, 1994a).

The U.S. EPA has not established a Reference Concentration (RfC) for propoxur, but has set an oral Reference Dose (RfD) at 0.004 milligrams per kilogram per day based on mild cholinergic symptoms and red blood cell cholinesterase inhibition in humans. The U.S. EPA estimates that consumption of this dose or less, over a lifetime, would not likely result in the occurrence of non-cancer chronic effects (U.S. EPA, 1994a).

No information on adverse reproductive or developmental effects in humans is available. In a few studies, pregnant rats orally exposed to propoxur had decreased numbers of pups, fetotoxic effects, and depressed fetal weight (U.S. EPA, 1994a).

Cancer: No information is available on the carcinogenic effects of propoxur in humans. Mixed results were obtained in animal studies. In a chronic feeding study of propoxur in rats, tumors of the bladder and the uterus were observed at high doses. No increase of tumors was found in another study of mice orally exposed to propoxur. The U.S. EPA has classified propoxur in Group B2: Probable human carcinogen (U.S. EPA, 1994a). The International Agency for Research on Cancer has not classified propoxur as to its carcinogenicity (IARC 1987a).